
A(nother) New Species of *Villarsia* (Menyanthaceae) from South Africa

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ABSTRACT. A third species of *Villarsia* from South Africa, *V. manningiana* sp. nov., differs from *V. capensis* and from *V. goldblattiana* in one or more of these characters: size of leaves and inflorescences, length of pedicels, number of flowers per inflorescence, number of ovules per ovary, and surface of seeds. As now circumscribed, *V. capensis* consists of an eastern and a western suite of local populations within the Western Cape Province.

Key words: Menyanthaceae, South Africa, *Villarsia*.

In 1999, I described a second species of *Villarsia*, *V. goldblattiana*, endemic to the southern Cape Peninsula of South Africa. Prior to 1999, only a single species of *Villarsia*, *V. capensis* (Houttuyn) Merrill, was recognized for Africa.

Villarsia capensis is based on a collection by Carl Peter Thunberg and consists of specimens that have larger leaves, taller inflorescences, and other floral characteristics that separate them from smaller plants also referred (until now) to *V. capensis*. It is probable that Thunberg collected his specimens at the eastern edge of the range of *V. capensis* near the Krom River; more recent collections from that region match his specimens in size and other vegetative and inflorescence features. Additional collections of the larger form also have been made ca. 100 km northeast of Cape Town near the western end of the range of *V. capensis*. Robert Compton, on the label of his 10900 (NBG) from the Ceres area, wrote that his specimens looked “very different from the Table Mountain swamp-plant!” Thunberg (1823) mentioned that *V. capensis* “crescit in Krum-rivier [= Krom River] et in summo Taffelberg.” Although the Table Mountain plants belong to the smaller variant, Thunberg clearly considered his two gatherings conspecific. In my 1999 paper, I commented on the existence of these variants and

stated, “No taxonomic separation of these two forms is suggested at present.” Up to that time, I had not seen plants of the larger form in the field, did not know whether populations of the larger form display a range of morphological variation, and had no evidence that the features that characterize the larger plants in the field are maintained in cultivation when grown alongside the more common smaller variant.

In early September 1998, in company with John Manning, Peter Goldblatt, and W. L. Culberson, I visited the farm (Ruigtevlei) where the amateur botanist I. B. Walters had collected the large variant in 1976 (Walters 1557, NBG), the most recent collection that I have seen. This farm is in the Slanghoek valley between Rawsonville and Dutoitskloof, ca. 75 km east-northeast of Cape Town. Although the farm occupies several hundred hectares, the landowner (P. P. van der Merwe) drove us to a likely site based on my description of presumed habitat characteristics. There I found a localized population of *Villarsia* in vegetative condition growing in wet, peat soil and in living *Sphagnum* in the shade among restionads and small shrubs. I dug up 12 individuals from throughout the site and brought them back to Berkeley, California, where they have grown and flowered for two seasons in an unheated greenhouse. In cultivation, these plants have retained the vegetative and inflorescence characteristics that distinguish them from the smaller variant also referred to *V. capensis* (as exemplified by individuals grown in Berkeley at the same time that originated at Nuweberg in 1990).

It is the larger variant to which the name *V. capensis* applies (Ornduff, 1999), and I consider that the larger and smaller variants are sufficiently different from each other that the smaller variant merits recognition as a third species of *Villarsia* in Africa. I am naming it *Villarsia manningiana* in

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appreciation of John Manning's considerable assistance to my studies of *Villarsia* in South Africa and in recognition of his important contributions to southern African biology, including the systematics of the Leguminosae, Iridaceae, and other plant families, his contributions to southern African entomology and to pollination biology, his coauthorship of two excellent regional wildflower guides, and his superb botanical illustrations.

Villarsia manningiana Ornduff, sp. nov. TYPE: South Africa. Western Cape Province: small perennial in wet boggy places, perianths bright yellow, frequent, Kogelberg, at the summit, Caledon District, 4100 ft., 20 Nov. 1967, *J. P. Rourke* 992 (holotype, NBG-86508).

Villarsiae capensis et *V. goldblattiana* affinis sed differt in his characteribus: lamina folii longissimi 25–50 mm (\bar{x} = 39 mm) longa, 10–27 mm (\bar{x} = 19 mm) lata; inflorescentia elatissima 13–29 cm (\bar{x} = 21 cm) elata, floribus 7–32 (\bar{x} = 18); pedicellus longissimus 13–25 mm (\bar{x} = 18 mm) longus; semina papillosa.

Perennials, erect, tufted, nonstoloniferous. Basal leaves erect, evergreen; petioles 2–17 cm long; blades fleshy, oblong to ovate, 10–50 mm long, 5–27 mm wide, rounded to cordate at base, usually with widely spaced, shallow teeth, occasionally entire; cauline leaves gradually reduced to scales distally. Inflorescences congested to open panicles with 7 to 32 flowers; the tallest inflorescences 13–29 cm tall, 0.9–1.6 times the length of the longest leaves; pedicels 5–25 mm long. Flowers distylous, open for only 1 day. Calyx lobes 5, \pm lanceolate, 4–5.5 mm long, 2–2.5 mm wide at their bases. Corollas yellow, lobes 5, linear to broadly obovate, sometimes winged, about twice the length of the calyx lobes, the margins fimbriate, usually hairy on portions of the upper surfaces. Ovules 1 or 2 per ovary. Capsules ovoid, equaling or slightly longer than the calyx lobes. Seeds yellow or brown, \pm orbicular, biconvex, usually with uniformly scattered papillae, sometimes sparsely papillate or nearly smooth.

Growing in wet soil, marshes, and stream margins, 244–1524 m.

Flowering mostly September to December.

Paratypes. SOUTH AFRICA. **Western Cape Province:** common in damp places, herbaceous with basal leaves on long pedicels (sic), flowers yellow with fringed edges, opening only in sunlight, Grabouw-Nuweberg Forest Station, alt. 500 m, 29 Oct. 1983, *C. Burman* 1238 (BOL); perennial herb with basal leaves, fls. yellow, on wet humus-rich marshy soil, Swartboskloof, Stellenbosch District, 5000 ft., 30 Oct. 1960, *W. L. J. van Rensburg* 2030 (BOL); E slopes of Somerset Sneeuwkop, Caledon

Division, 3500–4000 ft., Dec. 1939, *E. Esterhuysen* 2791 (BOL); Bains-Kloof, 2700 ft., Nov. 1896, *R. Schlechter* 9174 (BOL); Baviaans Kloof, off Bains Kloof, Paarl Division, 20 Oct. 1946, *F. M. Leighton* 2153 (BOL); Happy Valley, W of Bain's Kloof, 12 Sep. 1970, *R. Ornduff* 7267 (UC); in uliginosis ad fluv. Rivier Zonder Ende, locis montosis (Caledon), Nov., no collector (BOL-62343); flowers yellow, note slight toothiness of leaves, Kogel Berg, Caledon, 16 Nov. 1944, *W. F. Barker* 3312 (NBG); damp places, frequent, Vogelgat, Sip Lodge, Caledon Division, 1 Sep. 1979, 420 m, *I. Williams* 2821 (NBG); Tulbagh Waterfall, 800 ft(?), 12 Oct. 1890, *F. Guthrie* 2095 (NBG); Pringle Peak, Caledon, 12 Nov. 1954, *B. Maguire* 2655 (NBG); fl. yellow, in marshy or moist spots, along plateau path etc., Harold Porter Reserve, Simonstown, \pm 1000 ft., 12 Oct. 1989, *E. Esterhuysen* 36858 (NBG); becoming more frequent at higher elevations, petals yellow, hairy, herb with fleshy leaves, mountain slopes with S to SW aspect . . . N of Pringle Bay, Caledon Dist., 1200–2500 ft., 4 Nov. 1951, *H. B. Rycroft* 1231 (NBG); in summo monte Tabulari, 3500 ped., Dec. 1877, *H. Bolus* 4798 (BOL); marshy places, fl. yellow, Table Mt., 2 Jan. 1948, *R. J. Rodin* 3204 (BOL); near streams & in swampy places on plateau, above Window Gorge, Table Mt., 2500 ft., 6 Dec. 1945, *E. Esterhuysen* 12296 (BOL); swampy places, Table Mountain, Dec. 1907, *E. P. Phillips* 153 (NBG); Lower Plateau near Wynberg Reservoir, 20 Oct. 1895, *A. H. Wolley Dod* 167 (BOL); Prope Worcester, circa 800 ped., Jan., *H. Bolus* s.n. (BOL); growing along edge of pool, flowers yellow, petal edges frilly, Steenbras River catchment area, 1 Oct. 1981, *D. Snijman* 558 (NBG); in and at edge of "river" on Sir Lowry's Pass at junction of road to Steenbras Reservoir, 10 Nov. 1970, *R. Ornduff* 7613 (UC); common, in parts almost pure (gregarious) on wetter portion of burnt veld, Hooheberg, Knysna, 2500 ft., 20 Oct. 1922, *J. D. Keel* 982 (UC).

KEY TO SOUTH AFRICAN SPECIES OF *VILLARSIA*

- 1a. Petioles of longest leaves 19–32 cm (\bar{x} = 24 cm) long; tallest inflorescences more than 53 cm tall; ovules ca. 6 per ovary *V. goldblattiana*
- 1b. Petioles of longest leaves 7–23 cm (\bar{x} = 12.5 cm) long; tallest inflorescences less than 50 cm tall; ovules 2 per ovary.
 - 2a. Blades of longest leaves 50–90 mm (\bar{x} = 61 \pm 14 mm) long, 23–60 mm (\bar{x} = 34 \pm 14 mm) wide; tallest inflorescences 27–50 cm (\bar{x} = 37 \pm 8.3 cm) high with 40–85 (\bar{x} = 57 \pm 17) flowers; longest pedicels 7–17 mm (\bar{x} = 11 \pm 3 mm) long; seeds smooth or minutely and densely papillate on outer 0.5 mm of seed margin *V. capensis*
 - 2b. Blades of longest leaves 25–50 mm (\bar{x} = 39 \pm 9 mm) long, 10–27 mm (\bar{x} = 19 \pm 4 mm) wide; tallest inflorescences 13–29 cm (\bar{x} = 21 \pm 5 cm) high, with 7–32 (\bar{x} = 18 \pm 5) flowers; longest pedicels 13–25 mm (\bar{x} = 18 \pm 6 mm) long; seeds usually with uniformly scattered papillae, sometimes sparsely papillate or nearly smooth *V. manningiana*

An excellent photograph of a flowering individual of *V. manningiana* is in Burman and Bean (1985), a watercolor sketch is in Moriarity (1982), and a photograph of a flower is in Jackson (1982).

I have authored or coauthored papers that now

contain erroneous identifications of South African *Villarsia* because at the time they were published only *V. capensis* was recognized for Africa. In a paper on pollen by Nilsson and Ornduff (1973), specimens referred to *V. capensis* are *V. manningiana* except for my collection number 7099, which is *V. goldblattiana*. In a paper on cytology (Ornduff, 1974), two of the three chromosome counts reported for *V. capensis* are for *V. manningiana* and the third (my no. 7099) is for *V. goldblattiana*. The seeds illustrated by Chuang and Ornduff (1992) are those of *V. manningiana*, not *V. capensis*.

Oddly, though *V. capensis* is by far the most widely distributed of the South African species of *Villarsia*, much less is known about it than about the two restricted species.

The three South African species of *Villarsia* are distylous. Results of a pollination program using a single accession of *V. manningiana* indicated that in this population, distyly is associated with a strong incompatibility system (Ornduff, unpublished). The breeding system of the other two South African *Villarsia* species is unknown. The sample of living plants from the Slanghoek population of *V. capensis* produced six long-styled plants and five short-styled plants, suggesting a 1:1 morph ratio. This ratio is supportive of the possibility that this species possesses an incompatibility system associated with distyly, or at least that intermorph fertilizations are much more common than are intramorph ones. In the field, the Slanghoek plants possessed no spent inflorescences from prior flowering seasons, suggesting that flowering in this population may decline when fire has not removed the shrub cover and the consequent shading. This is consistent with my suggestion that the function of fire in inducing flowering in *V. goldblattiana* is primarily one of increasing light intensity at ground level by a temporary reduction in shading by the

dense overstory of fynbos shrubs and graminoid plants (Ornduff, 1999).

Because *V. goldblattiana* and *V. manningiana* have been separated from *V. capensis*, the range of *V. capensis*, as now circumscribed, occupies disjunct western and eastern areas within the Western Cape Province.

Representative western collections of *V. capensis* are: vlei, yellow, Cold Bokkeveld, 8 Dec. 1940, *R. H. Compton* 10900 (NBG); height 3 ft., 1900 ft. elevation, Ceres Mountains, Jan. 1892, *Guthrie* 2191 (NBG); yellow, frequent to 40 cm in sandy soil, 'Ruigtevlei' farm, Slanghoek, Rawsonville, 7 Nov. 1976, *I. B. Walters* 1557 (NBG).

Representative eastern collections of *V. capensis* are: in vlei, fl. yellow, 800 ft., Kirby, 4 Dec. 1942, *H. G. Fourcade* 5902 (BOL); fls. yellow, in vlei, Ralets [sic] Bosch [= Ratelsbosch] flats, 750 ft., Jan. 1909, *H. G. Fourcade* 396 (BOL); in rivulo, Wagenbooms R., Long Kloof, 1870, *H. Bolus* 2404 (BOL; mounted with *H. Bolus* 4798 and *J. Ecklon* s.n. in 1824, both *V. manningiana*).

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